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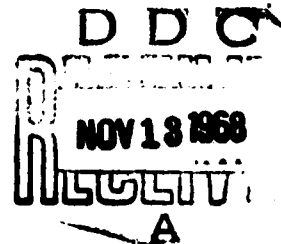
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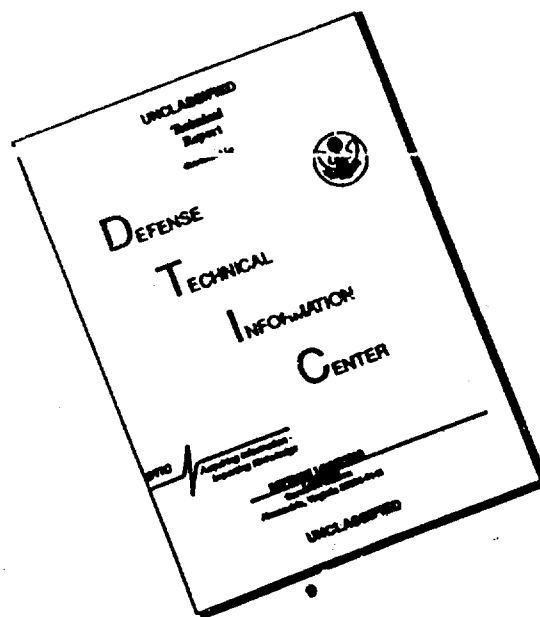
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## CEREAL CROP SMUT

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T.I. Zakharova

As in the past smut pathology was distributed in all areas in 1964 (Table 1). In the following we submit data on development of pathology in the different crops.

### Wheat

Kernel smut (*Tilletia caries* Tul. and *T. foetens* Berks) was widespread in all zones of cultivation of winter wheat, but there was a decrease in degree of development of the disease, particularly in the Forest-Steppe and Steppe zones.

As before, there was marked development of the disease in the Non-chernozem zone and Zone of Reclamation of Virgin and Waste Lands (Table 2).

In addition to the data submitted in Table 3, the highest degree of invasion was recorded in Ivanovskaya (22%), Zaporozhskaya (14%), Kirovogradskaya (11%) oblasts and Stavropol'skiy Kray (34%). In some regions there was intensive invasion of large areas: 1800 hectares in Chimkent-skaya Oblast (19 to 25%), 1500 hectares in Dzhabul'skaya Oblast (5%).

Visible development of smut was recorded on spring wheat in several oblasts (Table 4). Maximum development of the disease (14.2%) was observed on 450 hectares of the collective farm Rodina in Saraktashskiy Rayon, Orenburgskaya Oblast, as well as on 852 hectares in Permskaya Oblast (7.8%) and 1.4 thousand hectares in Kuybyshevskaya Oblast (3%). Cultivars Skala, Iskra (Omskaya Oblast) and Saratovskaya 29 (Kuybyshevskaya Oblast) were strongly affected. A decline in smut was noted in Kirovskaya Oblast, Bashkir ASSR, Buryat ASSR, Chuvash ASSR and Krasnoyarskiy Kray. Isolated cases of the disease were recorded in Kurskaya, Saratovskaya and Ul'yanovskaya oblasts.

Table 1  
Development of smut pathology on cereal crops (weighted mean percentages of involvement in the area examined)

Зоны (a)	(b) Озимая рожь		(c) Озимая пшеница		(d) Яровая пшеница		(e) Ячмень		(f) Просо		(h) Амарант	
	травянистые головки (i)	стеблевые головки (j)	травянистые головки (k)	стеблевые головки (l)	травянистые головки (m)	стеблевые головки (n)	травянистые головки (o)	стеблевые головки (p)	травянистые головки (q)	стеблевые головки (r)	травянистые головки (s)	стеблевые головки (t)
Северная (a) . . . . .	—	0,61	0,10	0,12	0,19	0,22	0,08	0,43	—	—	—	—
Нечерноземная (o) . . . . .	0,14	0,32	0,59	0,41	0,23	0,35	0,16	0,25	1,15	1,24	—	—
Северного Поволжья (p) . . . . .	—	0,48	0,10	0,19	0,33	0,52	0,27	0,70	1,20	Единичные растения	—	—
Лесостепная (q) . . . . .	0,01	0,01	0,06	0,06	0,12	0,17	0,16	0,25	0,70	1,69	—	0,38
Степная (r) . . . . .	—	0,01	0,07	0,06	0,05	0,23	0,12	0,42	0,82	1,10	—	0,26
Земляничная (s) . . . . .	—	—	0,40	0,02	—	—	0,23	—	—	1,10	—	—
Озимая пшеница и залеж- ная земля (t) . . . . .	—	0,30	0,40	0,25	0,21	0,41	0,76	0,60	0,57	Единичные растения	—	—
Восточной Сибири и Забай- калья (u) . . . . .	—	—	—	—	0,58	0,65	0,05	0,67	0,80	—	—	—
Дальневосточная (v) . . . . .	—	—	—	—	—	0,08	—	0,03	0,01	0,75	—	—
Среднеазиатская (w) . . . . .	—	—	0,20	0,03	0,33	0,02	0,27	0,01	0,11	2,50	—	—
В среднем по СССР в 1964 г. (x) . . . . .	0,03	0,29	0,24	0,14	0,25	0,29	0,30	0,37	0,53	1,04	0,32	0,30
В среднем по СССР в 1963 г. (y) . . . . .	0,02	0,44	0,40	0,37	0,29	0,49	0,36	0,49	0,66	1,27	0,30	0,30

Legend:

- a) zone  
b) winter rye  
c) winter wheat  
d) spring wheat  
e) barley  
f) oats  
g) millet  
h) maize  
i) kernel smut  
j) stem smut  
k) Ustilago  
l) smut  
m) vesicular smut  
n) Northern  
o) Nonchernozem  
p) Northern Povolzh'ye  
q) Forest-steppe  
r) Steppe  
s) Transcaucasian  
t) Reclaimed Virgin and Waste Lands  
u) Northern Siberia and Transbaykal  
v) Far Eastern  
w) Central Asian  
x) 1964 mean for USSR  
y) 1963 mean for USSR  
z) isolated plants

Table 2  
Involvement of winter wheat with kernel smut in 1964

Республика область (a)	Обследо- ванная площадь (тыс. га) (b)	Средне- взвешен- ный процент поражения (c)	Республика область (a)	Обследо- ванная площадь (тыс. га) (b)	Средне- взвешен- ный процент поражения (c)
Азербайджанская ССР (d)	7.9	0.40	Новгородская обл. (i)	1.9	2.40
Брянская обл. (e)	41.7	0.61	Одесская обл. (j)	12.2	0.34
Горьковская обл. (f)	21.2	0.21	Оренбургская обл. (k)	1.4	0.40
Латвийская ССР (g)	48.0	0.40	Тульская обл. (l)	67.8	0.91
Литовская ССР (h)	35.0	0.39	Черкасская обл. (m)	5.9	0.39

Legend:

- |   |                         |
|---|-------------------------|
| a) republic, oblast                         | g) Latvian SSR          |
| b) examined area<br>(thousands of hectares) | h) Lithuanian SSR       |
| c) weighted mean percentage<br>of invasion  | i) Novgorodskaya Oblast |
| d) Azerbaydzhan SSR                         | j) Odesskaya Oblast     |
| e) Bryanskaya oblast                        | k) Orenburgskaya Oblast |
| f) Gor'kovskaya Oblast                      | l) Tul'skaya Oblast     |
|   | m) Cherkasskaya Oblast  |

Table 3  
Data on maximum kernel smut invasion of winter wheat in 1963-1964

Республика область (a)	Район (b)	Хозяйство (c)	Обследо- ванная площадь (га) (d)	Процент поражения (e)
Алма-Атинская обл. (f)	—	Совхоз „Гигант“ (x)	650	8.0
Брянская обл. (g)	Брянский (g) (m)	Колхоз им. Кирова (a)	107	7.7
Владимирская обл. (h)	Бывш. Струнинский	Колхоз „Дружба“ (t)	28	19.7
Горьковская обл. (i)	Богородский (n)	Совхоз „Ворсмен- ский“ (u)	225	14.6
Ивановская обл. (j)	Сокольский (o)	Колхоз им. Соколова (v)	22	20.0
Марийская АССР (k)	Горномарийский (p)	Колхоз им. Чапаева (w)	49	15.1
Эстонская ССР (l)	Хаапсалуский (q)	Колхоз „Вальгус“ (x)	12	17.4

Legend:

- |                                |                         |
|--------------------------------|-------------------------|
| a) republic, oblast            | m) formerly Struninskiy |
| b) rayon                       | n) Bogorodskiy          |
| c) farm                        | o) Sokol'skiy           |
| d) examined acreage (hectares) | p) Gornomariyskiy       |
| e) percentage of involvement   | q) Khaapsaluskiy        |
| f) Alma-Atinskaya Oblast       | r) Gigant State Farm    |
| g) Bryanskaya Oblast           | s) Kirov Collective "   |
| h) Vladimirskaya Oblast        | t) Druzhba " "          |
| i) Gor'kovskaya Oblast         | u) Vorsmenskiy State "  |
| j) Ivanovskaya Oblast          | v) Sokolov Collective " |
| k) Mariyskaya ASSR             | w) Chapayev " "         |
| l) Estonian SSR                | x) Val'gus " "          |

Table 4  
Kernel smut invasion of spring wheat

Республика, область (a)	Обследо- ванная площадь (тыс. га) (b)	Средне- взвешен- ный процент поражения (c)	Республика, область	Обследо- ванная площадь (тыс. га)	Средне- взвешен- ный процент поражения
Куйбышевская обл.(d)	4,0	1,00	Семипалатинская обл.(h)	3,9	0,60
Новгородская обл.(e)	7,0	1,20	Томская обл.(i)	132,7	0,10
Оренбургская обл.(f)	29,0	1,56	Якутская АССР (j)	2,5	2,00
Пензенская обл.(g)	91,9	0,64			

Legend:

- a) republic, oblast
- b) examined area (thousands of hectares)
- c) weighted mean percentage of involvement
- d) Kuybyshevskaya Oblast
- e) Novgorodskaya Oblast
- f) Orenburgskaya Oblast
- g) Penzenskaya Oblast
- h) Semipalatinskaya Oblast
- i) Tomskaya Oblast
- j) Yakut ASSR

Powdery smut (*Ustilago tritici* Jens.) showed visible development on winter wheat in the Nonchernozem zone, Northern Povolzh'ye zone and in the Zone of Reclamation of Virgin and Waste Lands (Table 5).

Table 5  
Ustilago invasion of winter wheat in 1964

Республика, область (a)	Обследо- ванная площадь (тыс. га) (b)	Средне- взвешен- ный процент поражения (c)	Республика, область	Обследо- ванная площадь (тыс. га)	Средне- взвешен- ный процент поражения
Брянская обл.(d)	41,7	0,44	Оренбургская обл.(h)	60,0	0,51
Горьковская обл.(e)	2,0	0,15	Орловская обл.(i)	25,6	0,24
Калимыцкая АССР(f)	34,7	0,10	Тульская обл.(j)	56,9	0,57
Литовская ССР(g)	35,0	0,24	Черкасская обл.(k)	53,9	0,24

Legend:

- a) republic, oblast
- b) examined area (thousands of hectares)
- c) weighted mean percentage of involvement
- d) Bryanskaya Oblast
- e) Gor'kovskaya Oblast
- f) Kalmyk ASSR
- g) Lithuanian SSR
- h) Orenburgskaya Oblast
- i) Orlovskaya Oblast
- j) Tul'skaya Oblast
- k) Cherkasskaya Oblast

Maximum invasion by ustilago was recorded in the Oktemberyanskiy Rayon of Armenian SSR (13.2%). The hot and dry weather during blooming of winter wheat limited development of this disease in Kurskaya, Chernovitskaya, Vinnitskaya and Zaporozhskaya oblasts.

With respect to spring wheat development of this disease remained almost at the same level as in 1963 (Table 6). Some increase in intensity of the disease was noted in the Steppe zone. Marked invasion involving large areas was noted on 1053 hectares in Volgogradskaya Oblast (4%), 3000 hectares in Saratovskaya Oblast (5%), 1800 hectares in Uralskaya Oblast (8%), and 2463 hectares in Aktyubinskaya Oblast (5%).

Table 6  
Ustilago invasion of spring wheat in 1964

Республика, область (a)	Обследованная площадь (тыс. га) (b)	Средневзвешенный процент поражения (с)	Республика, область	Обследованная площадь (тыс. га)	Средневзвешенный процент поражения
Актыубинская обл.(d)	3,7	0,56	Пензенская обл.(i)	91,9	0,57
Владимирская обл.(e)	13,7	0,57	Пермская обл.(j)	263,2	0,30
Волгоградская обл.(f)	155,8	0,57	Саратовская обл.(k)	790,9	0,57
Куйбышевская обл.(g)	198,2	0,70	Семипалатинская обл.(l)	215,0	1,00
Павлодарская обл.(h)	1,2	0,60	Чувашская АССР(m)	17,8	0,57

Legend:

- |  |                            |
|--|----------------------------|
| a) republic, oblast                      | g) Kuybyshevskaya Oblast   |
| b) examined area (thousands of hectares) | h) Pavlodarskaya Oblast    |
| c) weighted mean percentage of invasion  | i) Penzenskaya Oblast      |
| d) Aktyubinskaya Oblast                  | j) Permskaya Oblast        |
| e) Vladimirskaia Oblast                  | k) Saratovskaya Oblast     |
| f) Volgogradskaya Oblast                 | l) Semipalatinskaya Oblast |
|  | m) Chuvash ASSR            |

Very intensive invasion was recorded in Chuvash ASSR (10%), Karagandinskaya (12.8%) and other oblasts (Table 7).

Dwarf smut (*Tilletia controversa* Kuhn) presented marked invasion of winter wheat in the farms of the mountainous zone of Alma-Atinskaya Oblast and Armenian SSR (Table 8). Crop losses caused by this disease constituted 2859.9 centners in former Sarkandskiy Rayon. According to the data of the Armenian Scientific Research Institute of Plant Protection there is annual manifestation of the disease in this republic in Razdanskiy, former Kutayskiy, Azizbekovski and Yekhegnadzorskiy rayons. The disease is reported at farms situated at an altitude of 1400-2600 meters above sea level.

Stem smut (*Tubercinia tritici* Liro) is usually distributed in the southern regions of wheat cultivation and is not encountered north of the 45th parallel. However in the last few years there have been repeated

reports from oblast stations of plant protection and reporting and prognostication points about the presence of this disease in Orlovskaya (1962), Yaroslavskaya, Zhitomirskaya, Ul'yanovskaya, Tyumenskaya (1963-1964), Tul'skaya (1964) oblasts and Chuvash ASSR (1964) referable both to spring and winter wheat. In Chuvash ASSR this form of smut has been discovered on Ul'yanovka and Lutescence 62 cultivars. These facts force us to give serious attention to definition of the spectrum of the disease and its pathogen. Specimens sent in from Kalininskaya Oblast (1964) did not substantiate the presence of the pathogen in question: the plants were injured by *Chlorops pumilionis* larvae with subsequent invasion by saprophytic fungi. In the future herbarium samples must be sent to the All-Union Institute of Plant Protection to confirm identification of stem smut.

Table 7  
Data on maximum involvement of spring wheat with powdery smut in 1964

Республика, область (a)	Район (b)	Хозяйство (c)	Обследованная площадь (га) (d)	Процент поражения (e)
Владимирская обл. (f)	Юрьев-Польский (l)	—	43	6,0
Горьковская обл. (g)	—	Колхоз "Серп и Молот" (p) . . . .	100	6,7
Куйбышевская обл. (h)	Большеглушицкий (m)	Колхоз им. Фурманова (q) . . . .	478	9,0
Оренбургская обл. (i)	Соль-Илецкий (n)	Совхоз "Маяк" (r) . . . .	666	6,5
Саратовская обл. (j)	—	Совхоз "Александровский" (s) . . . .	500	12,0
Якутская АССР (k)	Бывш. Заречный (o)	Колхоз им. Ленина (t)	—	7,4

Legend:

- |                              |                                 |              |
|------------------------------|---------------------------------|--------------|
| a) republic, oblast          | k) Yakut ASSR                   |              |
| b) rayon                     | l) Yur'yev-Pol'skiy             |              |
| c) farm                      | m) Bol'sheglushitskiy           |              |
| d) examined area (hectares)  | n) Sol'-Ilet'skiy               |              |
| e) percentage of involvement | o) Former Zarechnyy             |              |
| f) Vladimirskaya Oblast      | p) Hammer and Sickle collective | Farm         |
| g) Gor'kovskaya Oblast       | q) Furmanov                     | " "          |
| h) Kuybyshevskaya Oblast     | r) Mayak                        | State "      |
| i) Orenburgskaya Oblast      | s) Aleksandrovskiy              | " "          |
| j) Saratovskaya Oblast       | t) Lenin                        | Collective " |

Winter Rye

Stem smut (*Tubercinia oculata* Liro) is widespread in all zones, but there has been a decrease in weighted mean percentage of involvement by 0.15 as compared to 1963. In some fields manifestation of the disease was considerable, for example in Novgorodskaya (4.8%), Gor'kovskaya (5%), Permskaya (5%), Odesskaya (6%) and other oblasts (Table 9).



Table 8  
Dwarf smut invasion of winter wheat in 1964

Республика, область (a)	Район (b)	Хозяйство (c)	Обсле- ванная площадь (га) (d)	Процент поражения (e)
Алма-Атинская обл. (f)	Бывш. Сарканд- ский (h)	Колхоз "Путь Ильича" (k) . . .	666	10,3
Армянская ССР (g) {	Ехегнадзорский (i) Разданский (j)	Колхоз "Черкасская оборона" (l) . . .	255	11,6
		Село Гнишек (m) .	12	8,0
		Село Фонтан (n) .	93	70,0

Legend:

- |                              |                                 |
|------------------------------|---------------------------------|
| a) republic, oblast          | h) former Sarkandskiy           |
| b) rayon                     | i) Yekhegnadzorskiy             |
| c) farm                      | j) Razdanskiy                   |
| d) examined area (hectares)  | k) Put' Il'icha collective farm |
| e) percentage of involvement | l) Cherkasskaya oborona " "     |
| f) Alma-Atinskaya Oblast     | m) Gnishek village              |
| g) Armenian SSR              | n) Fontan village               |

Table 9  
Data on maximum invasion of rye by stem smut in 1964

Республика, область (a)	Район (b)	Колхоз (c)	Обсле- ванная площадь (га) (d)	Процент поражения (e)
Гомельская обл. (f)	Мозырский (l)	"Родина" (q) . . .	24	5,2
Ивановская обл. (g)	Сокольский (m)	"Знамя труда" (r) . .	110	9,0
Калужская обл. (h)	Жиздринский (n)	Им. Дмитрова (s) .	56	35,0
Костромская обл. (i)	Макарьевский (o)	—	110	13,0
Тюменская обл. (j)	—	"Большевик" (t) . .	51	13,2
Эстонская ССР (k)	Пярнуский (p)	"Октябрь" (u) . . .	25	8,5

Legend:

- |                              |                  |
|------------------------------|------------------|
| a) republic, oblast          | l) Mozyrskiy     |
| b) rayon                     | m) Sokol'skiy    |
| c) collective farm           | n) Zhizdrinskiy  |
| d) examined area (hectares)  | o) Makar'yevskiy |
| e) percentage of involvement | p) Pyarnuskiy    |
| f) Gomel'skaya Oblast        | q) Rodina        |
| g) Ivanovskaya Oblast        | r) Znamya truda  |
| h) Kaluzhskaya Oblast        | s) imeni Dmitrov |
| i) Kostromskaya Oblast       | t) Bolshevik     |
| j) Tyumenskaya Oblast        | u) Oktoober      |
| k) Estonian SSR              |                  |

Some increase in invaded area was observed in Latvian SSR (from 2,900 hectares to 3,800 hectares) and in Pskovskaya Oblast (to 50,400 hectares).

Kernel smut (*Tilletia secalis* Kuhn) was encountered in small foci in Kurskaya, Smolenskaya, Vladimirskaia, Tul'skaya, Chernigovskaya, Donetskaya, Rostovskaya, Permskaya, Omskaya oblasts and in Bashkir ASSR.

Powdery smut (*Ustilago vavilovii* Jacz.) was observed in Omskaya, Tyumenskaya, Rostovskaya and Tulskaia oblasts. Maximum invasion was recorded in Vladimirskaia Oblast (2.8%).

#### Barley

Rock smut (*Ustilago hordei* Kellern. et Swin) was encountered to a significant extent in the Zone of Reclamation of Virgin and Waste Lands and in the zone of the Northern Povolzh'ye (Table 10).

Table 10  
Kernel smut invasion of barley in 1964

Область (a)	Обследованная площадь (тыс. га) (b)	Средневзвешенный процент пораженности (c)	Область	Обследованная площадь (тыс. га) (d)	Средневзвешенный процент пораженности (e)
Воронежская (d) . . .	338,4	0,38	Кокчетавская (h) . .	76,9	0,40
Горьковская (e) . . .	20,2	0,20	Куйбышевская (i) . .	24,0	0,67
Карагандинская (f) . .	40,3	0,70	Одесская (j) . . .	54,8	0,38
Кемеровская (g) . . .	117,7	0,32	Семипалатинская (k) .	80,8	1,40

#### Legend:

- |  |                     |
|--|---------------------|
| a) oblast                                | f) Karagandinskaya  |
| b) examined area (thousands of hectares) | g) Kemerovskaya     |
| c) weighted mean involvement (%)         | h) Kokchetavskaya   |
| d) Voronezhskaya                         | i) Kuybyshevskaya   |
| e) Gor'kovskaya                          | j) Odesskaya        |
|  | k) Semipalatinskaya |

Intensive development of smut was often observed over large areas: 1000 hectares in Saratovskaya Oblast (8%), 1548 hectares in Omskaya Oblast (over 5%), 880 hectares in North-Kazakhstanskaya Oblast (over 4%) and in other oblasts (Table 11).

An increase in this disease has been noted in Voronezhskaya, Kurskaya, Vinnitskaya and Omskaya oblasts, and a two to three-fold decrease in area involved, as compared to 1963, in Kirovogradskaya, Bryanskaya, Khar'kovskaya, Sverdlovskaya, Kirovskaya oblasts and Krasnoyarskiy Kray. No smut was found in Dnepropetrovskaya and Nikolayevskaya oblasts.

Table 11  
Data on maximum invasion of barley by kernel smut in 1964

Республика, область (a)	Район (b)	Хозяйство (c)	Обследо- ванная площадь (га) (d)	Процент поражения (e)
Воронежская обл.(f)	Калачеевский (l)	Колхоз им. Ленина (q)	622	4,6
Оренбургская обл.(g)	Соль-Илецкий (m)	Колхоз им. Свердлова (r)	150	7,7
Полтавская обл.(h)	Кобелякский (n)	Колхоз "40 річчя Жовтня" (s)	—	5,1
Саратовская обл.(i)	Самойловский (o)	Колхоз "Спартак" (t)	500	10,0
Северо-Казакстан- ская обл.(j)	—	Совхоз им. Дзержин- ского (u)	371	10,0
Эстонская ССР (k)	Хаапсалуский (p)	Колхоз "Вальгус" (v)	12	17,4

Legend:

- |                                 |                                    |
|---------------------------------|------------------------------------|
| a) republic, oblast             | l) Kalacheyevskiy                  |
| b) rayon                        | m) Sol'-Ilets'kiy                  |
| c) farm                         | n) Kobelyakskiy                    |
| d) area examined (hectares)     | o) Samoylovskiy                    |
| e) percentage of involvement    | p) Khaapsaluskiy                   |
| f) Voronezhskaya Oblast         | q) Lenin Collective Farm           |
| g) Orenburgskaya Oblast         | r) Sverdlov " "                    |
| h) Poltavskaya Oblast           | s) 40 Richchya Zhovtnya Coll. Farm |
| i) Saratovskaya " "             | t) Spartak Collective Farm         |
| j) North-Kazakhstanskaya Oblast | u) Dzerzhinskiy State " "          |
| k) Estonian SSR                 | v) Val'gus collective " "          |

According to the data of the seed inspection laboratories there were many uncertified seeds in the farms of Ryazanskaya and Donetskaya oblasts because of smut. In order to reduce the incidence of disease in 1965, meticulous smut control measures must be instituted.

Powdery smut (*Ustilago nuda* Kellern. et Swin.) showed almost no decline as compared to 1963. As in the preceding years, there was marked development of the disease in the zones of the Northern Povolzh'ye, Eastern Siberia and of Reclamation of Virgin and Waste Lands (Table 12). The weighted mean percentage of involvement decreased by only 0.15 in all of USSR, which is indicative of stabilization of the disease.

In addition to data submitted in Table 13, maximum development of smut was recorded in Dnepropetrovskaya (9.9%) and Ul'yanovskaya (64%) oblasts.

Oats

Kernel smut (*Ustilago levis* Magn.) and powdery smut (*Ustilago avenae* Jens) continue to be seen in significant measure in the Northern Povolzh'ye, Steppe and Forest-Steppe zones (Table 14).

Table 12  
Powdery smut invasion of barley in 1964

Республика, область (a)	Обследованная площадь (тыс. га) (b)	Средневзвешенный процент поражения (c)	Республика, область	Обследованная площадь (тыс. га)	Средневзвешенный процент поражения
Архангельская обл. (d)	2,8	0,60	Латвийская ССР (j)	48,0	0,10
Вологодская обл. (e)	2,1	0,70	Одесская обл. (k)	54,8	0,40
Волгоградская обл. (f)	68,6	0,72	Оренбургская обл. (l)	55,0	1,74
Владимирская обл. (g)	13,9	0,21	Пермская обл. (m)	16,3	0,21
Калмыцкая АССР (h)	34,7	0,10	Северо-Казанская обл. (n)	126,1	6,74
Куйбышевская обл. (i)	91,9	1,20	Черкасская обл. (o)	12,5	0,80

- Legend: Куйбышевская обл. (i). 91,9 1,20
- a) republic, oblast
  - b) examined area (thousands of hectares)
  - c) weighted mean involvement (%)
  - d) Arkhangel'skaya Oblast
  - e) Vologodskaya Oblast
  - f) Volgogradskaya Oblast
  - g) Vladimirskaya Oblast
  - h) Kalmyk ASSR
  - i) Kuybyshevskaya Oblast
  - j) Latvian SSR
  - k) Odesskaya Oblast
  - l) Orenburgskaya Oblast
  - m) Permskaya Oblast
  - n) North Kazakhstanskaya Oblast
  - o) Cherkasskaya Oblast

Table 13  
Data on maximum invasion of barley by powdery smut in 1964

Республика, область (a)	Район (b)	Хозяйство (c)	Обследованная площадь (га) (d)	Процент поражения (e)
Башкирская АССР (f)	Уфимский (m)	Совхоз „Шемьяк“ (t)	440	11,4
Витебская обл. (g)	Витебский (n)	Совхоз „Вороны“ (u)	25	12,0
Донецкая обл. (h)	Великоновоселковский (o)	Колхоз „Родина“ (v)	130	5,0
Куйбышевская обл. (i)	Сергиевский (p)	Совхоз „Победа“ (w)	120	10,0
Оренбургская обл. (j)	Шарлыкский (q)	Совхоз им. К. Маркса (x)	108	15,0
Полтавская обл. (k)	Глобинский (r)	Колхоз им. Калинина (y)	60	12,0
Ростовская обл. (l)	Октябрьский (s)	Колхоз „Родина“ (z)	470	15,0

- Legend:
- a) republic, oblast
  - b) rayon
  - c) farm
  - d) examined area (hectares)
  - e) percentage of involvement
  - f) Bashkir ASSR
  - g) Vitebskaya Oblast
  - h) Donetskaya Oblast
  - i) Kuybyshevskaya Oblast
  - j) Orenburgskaya "
  - k) Poltavskaya "
  - l) Rostovskaya Oblast
  - m) Ufimskiy
  - n) Vitebskiy
  - o) Velikonovoselkovskiy
  - p) Sergiyevskiy
  - q) Sharlykskiy
  - r) Globinskiy
  - s) Oktyabr'skiy
  - t) Shemyak State Farm
  - u) Vorona " "
  - v) Rodina Collective Farm
  - w) Pobeda State Farm
  - x) K. Marx " "
  - y) Kalinin Collective Farm
  - z) Rodina " "

Table 14  
Invasion of oats by powdery smut in 1964

Республика область (a)	Обсле- дуемая площадь (тыс. га) (b)	Средневе- щечный про- цент пораже- ния (c)	Республика область	Обсле- дуемая площадь (тыс. га)	Средневе- щечный про- цент пораже- ния
Башкирская АССР(d)	38,3	0,80	Новгородская обл.(j)	4,8	2,00
Брянская обл.(e)	19,5	0,96	Пермская обл.(k)	50,1	0,42
Бурятская АССР(f)	20,2	0,66	Полтавская обл.(l)	10,1	0,50
Горьковская обл.(g)	2,6	1,00	Ростовская обл.(m)	14,1	0,50
Запорожская обл.(h)	10,0	0,77	Оренбургская обл.(n)	11,0	1,90
Куйбышевская обл.(i)	5,0	2,47	Тульская обл.(o)	31,7	0,80

Legend:

- |   |                         |
|---|-------------------------|
| a) republic, oblast                     | h) Zaporozhskaya Oblast |
| b) area examined (thousands of hectares | i) Kuybyshevskaya "     |
| c) weighted mean involvement (%)        | j) Novgorodskaya Oblast |
| d) Bashkir ASSR                         | k) Permskaya "          |
| e) Bryanskaya Oblast                    | l) Poltavskaya "        |
| f) Buryat ASSR                          | m) Rostovskaya "        |
| g) Gor'kovskaya Oblast                  | n) Orenburgskaya "      |
|   | o) Tul'skaya "          |

In some farms cases of severe manifestation of the disease have been recorded (Table 15). Intensive involvement was found on 972 hectares at the Vostok collective farm in Melekesskiy Rayon, Ul'yanovskaya Oblast (45%). Sovetskaya cultivar (Odesskaya and Donetskaya Oblasts), Pobeda (Kemerovskaya Oblast), Zolotoy Dozhd' (Tyumenskaya Oblast) were struck the most, Lokhovskiy and Orel were less susceptible. A decline in the disease was observed in Latvian SSR, Kaliningradskaya, Kirovskaya and Poltavskaya oblasts.

Maize

Vesicular smut (*Ustilago maydis* Corda) was widespread in all areas but to a somewhat lesser extent than in 1963. There was a particularly marked decline in morbidity in Northern Povolzh'ye and in the Zone of Reclamation of Virgin and Waste Lands. In addition to the data given in Table 16, considerable smut invasion was recorded on the irrigated fields of Kalmyk ASSR (60-70%), Saratovskaya (64%) and Khersonskaya (22.2%) oblasts, which is related to the fact that corn is cultivated by the one crop system. No smut was found in Karagandinskaya and North-Kazakhstanskaya oblasts.

The extent of susceptibility of a series of maize varieties to smut in the Ukraine, Northern Caucasus and in Georgia is indicated in the article by F.Ye. Nemliyenko and G.A. Grisenko included in the present collection.

Table 15  
Maximum invasion of oats by smut (totals for both species) in 1964

Республика, область (a)	Район (b)	Хозяйство (c)	Обсле- зованная площадь (га) (d)	Процент поражения (e)
Гомельская обл. (f)	Мозырский (n)	Колхоз им. Калинина (v)	5	19,6
Донецкая обл. (g)	Славянский (o)	Колхоз "Ленинский путь" (w)	15	12,7
Ивановская обл. (h)	Тейковский (p)	Колхоз "Заря" (x)	27	11,0
Куйбышевская обл. (i)	Сергиевский (q)	Совхоз "Красный строитель" (y)	211	14,2
Ленинградская обл. (j)	Лодейнопольский (r)	Колхоз "1 мая" (z)	—	12,0
Марийская АССР (k)	Мари-Турекский (s)	Колхоз "Рассвет" (aa)	105	15,2
Оренбургская обл. (l)	Кувандыкский (t)	Совхоз "Горный" (bb)	52	40,0
Саратовская обл. (m)	Балашовский (u)	Колхоз "За мир" (cc)	190	14,5

Legend:

- |                              |                                 |
|------------------------------|---------------------------------|
| a) republic, oblast          | p) Teykovskiy                   |
| b) rayon                     | q) Sergiyevskiy                 |
| c) farm                      | r) Lodeynopol'skiy              |
| d) examined area (hectares)  | s) Mari-Turekskiy               |
| e) percentage of involvement | t) Kuvandykskiy                 |
| f) Gomel'skaya Oblast        | u) Balashovskiy                 |
| g) Donetskaya "              | v) Kalinin Collective Farm      |
| h) Ivanovskaya "             | w) Leninskiy Put' "             |
| i) Kuybyshevskaya "          | x) Zarya "                      |
| j) Leningradskaya "          | y) Krasnyy stroitel' State Farm |
| k) Mariyskaya ASSR           | z) 1 May Collective Farm        |
| l) Orenburgskaya Oblast      | aa) Rassvet "                   |
| m) Saratovskaya "            | bb) Gornyy State "              |
| n) Mozyrskiy                 | cc) Za mir Collective "         |
| o) Slavyanskiy               |                                 |

Powdery smut of maize (*Sorosporium reilianum* [Kuhn]) developed in several oblasts in the Steppe and Forest-steppe zones. Marked invasion in some areas was noted on 50 hectares of Kurskaya oblast (18%), 100 hectares in Ryazanskaya Oblast (4%), 330 hectares in Vinnitskaya Oblast (9%), Poltavskaya (12%), Khar'kovskaya (5.6%), Chernigovskaya (3%) oblasts and 300 hectares in Kabardino-Balkar ASSR (5%). Widening of the spectrum and increase in intensity of manifestation of the disease were observed on 17,000 hectares in Kalmyk ASSR (weighted mean involvement: 2.3%), on 133 hectares in Poltavskaya (weighted mean involvement: 3.2%) and Dnepropetrovskaya oblasts.

Millet

Smut (*Sphacelotheca paniclemiliacei* Bubak) was distributed in all zones of cultivation of this crop, but manifestation of the disease was less intensive than in previous years. For example, in the Zone of Reclamation of Virgin and Waste Lands, the weighted mean percentage of

Table 16  
Invasion of maize by vesicular smut in 1964

Край, область (a)	Обследо- ванная площадь (тыс. га) (b)	Средне- взвешен- ный про- цент пора- жения (c)	Хозяйство и максимальное поражение посевов (d)
Брянская обл. (e)	1,7	4,50	Совхоз «Липецкий» — 9% (l)
Винницкая обл. (f)	28,8	0,13	Колхоз «Россия» — 19% (m)
Волгоградская обл. (g)	41,6	0,50	Колхоз «Советская Россия» — 12% (n)
Краснодарский край (h)	33,5	3,60	Лабинский район — до 40% (o)
Полтавская обл. (i)	185,0	5,10	Лубенский район, колхоз «Пере- мога» — 22% (p)
Черкасская обл. (j)	26,5	6,30	Корсунь-Шевченковский район, колхоз «Украина» — 8% (q)
Херсонская обл. (k)	75,0	0,90	Скадовский район, колхоз «Нове Життя» — 24% (r)

Legend:

- |  |   |
|--|---|
| a) kray, oblast                            | k) Khersonskaya Oblast                                    |
| b) examined area (thousands of hectares)   | l) Lipetskiy State Farm                                   |
| c) weighted mean percentage of involvement | m) Rossiya Collective Farm                                |
| d) farm and maximum invasion of crops      | n) Sovetskaya Rossiya Collective Farm                     |
| e) Bryanskaya Oblast                       | o) Labinskiy Rayon -- up to 40%                           |
| f) Vinnitskaya "                           | p) Lubinskiy Rayon, Peremoga Collective Farm              |
| g) Volgogradskaya Oblast                   | q) Korsun'-Shevchenkovskiy Rayon, Ukraina Collective Farm |
| h) Krasnodarskiy Kray                      | r) Skadovskiy Rayon, Nove Zhittya Collective Farm         |
| i) Poltavskaya Oblast                      |   |
| j) Cherkasskaya "                          |   |

Table 17  
Invasion of millet by smut in 1964

Область (a)	Обследо- ван- ная площадь (тыс. га) (b)	Средне- взвешен- ный про- цент пора- жения (c)	Область	Обследо- ван- ная площадь (тыс. га) (b)	Средне- взвешен- ный про- цент пора- жения (c)
Воронежская (d) . . .	62,6	0,40	Орсибургская (i) . . .	46,5	2,07
Волгоградская (e) . . .	33,0	2,32	Павлодарская (j) . . .	72,2	2,30
Кокчетавская (f) . . .	5,3	1,80	Полтавская (k) . . .	9,1	0,20
Куйбышевская (g) . . .	23,3	1,60	Ростовская (l) . . .	1,8	1,20
Одесская (h) . . . . .	4,9	0,54	Саратовская (m) . . .	82,9	2,00

Legend:

- |  |                  |
|--|------------------|
| a) oblast                                | h) Odesskaya     |
| b) examined area (thousands of hectares) | i) Orenburgskaya |
| c) weight mean involvement (%)           | j) Pavlodarskaya |
| d) Voronezhskaya                         | k) Poltavskaya   |
| e) Volgogradskaya                        | l) Rostovskaya   |
| f) Kokchetavskaya                        | m) Saratovskaya  |
| g) Kuybyshevskaya                        |                  |

Involvement dropped by more than three times, while in Eastern Siberia and Zubaykai'ye it dropped from 0.91 to 0.04%. However susceptibility of millet to smut is still high, as indicated by the data in Table 17.

Further severe invasion was noted in some parts of Ul'yankovskaya (20%), Volgogradskaya (18%), Saratovskaya (17%), Khar'kovskaya (15.5%), Luganskaya (12%) and other oblasts (Table 16).

Table 16  
Data on maximum invasion of millet by powdery smut in 1964

Область	Район	Хозяйство	Объем посева пшеницы (га)	Процент поражения
(a)	(b)	(c)	(d)	(e)
Воронежская (f)	Россошанский (i)	Колхоз "Заречье" (q)	233	5,0
Краснодарская	Колыбанский	Колхоз "Красный путь" (r)	172	15,0
Оренбургская (j)	—	Совхоз "Урожайный" (s)	25	42,1
Орловская (k)	Адамовский (n)	Совхоз "Авангард" (u)	350	22,0
Ростовская (l)	—	Колхоз "Авангард" (v)	30	18,0
Саратовская (k)	Сальский (o)	Колхоз "Верный путь" (w)	63	12,6
Саратовская (k)	Ершовский (p)	Колхоз им. Ильича (w)	30	17,3

Legend:

- |                              |                              |
|------------------------------|------------------------------|
| a) oblast                    | m) Kolaybanskiy              |
| b) rayon                     | n) Anikhevskiy               |
| c) farm                      | o) Sal'skiy                  |
| d) examined area (hectares)  | p) Yershovskiy               |
| e) percentage of involvement | q) Zarech'ye collective Farm |
| f) Voronezhskaya             | r) Krasnyy Put' " "          |
| g) Volgogradskaya            | s) Urozhaynyy State " "      |
| h) Orenburgskaya             | t) Anikhevskiy " "           |
| i) Orlovskaya                | u) Avangard Collective " "   |
| j) Kostovskaya               | v) Vernyy Put' " "           |
| k) Saratovskaya              | w) Il'ich " "                |
| l) Rossoshanskiy             |                              |

In some rayons cases of significant development over large areas were recorded, for example on 1,600 hectares in Omskaya (over 5%) and 18,300 hectares in Pavlodarskaya (3.5%) oblasts. Marked smutting of seeds was noted in Bashkir ASSR, Kurskaya, Sumskaya and Dnepropetrovskaya oblasts.